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Disclosure of alternative performance measures among european firms: the role of leverage, loss and opportunism

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Abstract

Purpose – This study aims to examine the role of leverage in explaining variations in disclosure of alternative performance measures (APMs) in annual reports. It explores how leverage may simultaneously be associated with the disclosure of different types of APMs across profitable and loss-making firms. In addition, it explores the conditions under which managers are more likely to opportunistically disclose APMs to mislead investors.

Design/methodology/approach – Using a panel dataset of annual reports for publicly listed companies in the STOXX Europe 600 Index over an eight-year period, resulting in 3,683 firm-year observations, the study uses computer-aided text analysis to develop a measure that distinguishes between debt covenant-related and efficiency-related APMs.

Findings – The results suggest that debt covenant-related APMs are positively associated with leverage, whereas efficiency-related APMs are negatively associated. This indicates that leverage may influence different types of APM disclosures in opposite ways, potentially explaining mixed evidence in previous studies. In addition, the study finds that among highly leveraged firms, loss-making firms are more likely to disclose debt covenant-related APMs for opportunistic reasons than profitable firms.

Originality/value – The paper contributes to the literature on the role of leverage in explaining variations in APM disclosures of firms in two ways. First, current research on leverage as a determinant of corporate APM disclosure primarily examines the associations between leverage and the disclosure of APMs, but it does not provide evidence on how leverage may simultaneously be associated with the disclosure of different types of APMs. Second, this study contributes by examining the consequences of APM disclosure to distinguish managerial motivations – whether disclosures are intended to inform or mislead – which may help standard setters and regulators mitigate the risks associated with the voluntary disclosure of APMs.

Keywords Alternative performance measures, Leverage, Voluntary disclosure, Non-GAAP measures, Debt covenants, Opportunistic behaviour

Paper type Research paper

1. Introduction

To address the financial information needs of investors, companies increasingly disclose alternative performance measures (APMs) in annual reports in addition to the information

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that has to be reported on a mandatory basis. The voluntary disclosure of APMs, which includes all financial measures not defined in the applicable reporting framework (ESMA, 2015, 2020; Jana and McMeeking, 2021), may provide incremental information about future firm performance and financial position that is useful for investment decision-making and the estimation of financial risks. In particular, when mandatory reporting based on generally accepted accounting principles (GAAP) is less informative or insufficiently informative, investors' demand for corporate disclosure of APMs may increase (Campbell *et al.*, 2022; Leung and Veenman, 2018). However, the disclosure of APMs also provides managers with varying degrees of flexibility, enabling them to exploit their information advantage and strategically disclose APMs to actively shape investors' perceptions (Reimsbach, 2014). Consequently, the debate continues whether managers use these measures to provide decision-useful information or to mislead investors (Curtis *et al.*, 2014). Prior studies have found mixed results regarding the consequences of disclosing APMs on investment decision-making (e.g. Black *et al.*, 2018). Some research suggests that these disclosures can provide valuable information to investors, while others indicate that they are often used opportunistically by managers to mislead investors by inflating perceptions (e.g. Brosnan *et al.*, 2023; Campbell *et al.*, 2022; Guillamon-Saorin *et al.*, 2017). For these reasons, the increase in both the quantity and variety of voluntary APM disclosures may also pose risks to the credibility and integrity of the financial reporting system (e.g. Young, 2014). Standard setters and regulators, such as the International Accounting Standards Board (IASB), the Financial Accounting Standards Board (FASB), the European Securities and Markets Authority (ESMA) and the Securities and Exchange Commission (SEC), have recognized widespread informational issues in APM disclosures and positioned APM reporting as a high priority on their agendas (Chen *et al.*, 2021).

In this study, we examine the role of leverage in explaining variation in APM disclosures. Leverage is an investment strategy of using borrowed money to increase returns on risk capital (Demerjian, 2011). Managers may have incentives to disclose APMs related to leverage since these disclosures can help lenders and other capital providers better assess financial risks and monitor compliance with debt contracts, thereby potentially reducing the cost of capital. However, managers may also use APM disclosures opportunistically to mislead investors. In addition, prior studies have reported inconsistent evidence regarding whether leverage is positively, negatively or not related to disclosure of APMs (Jana and McMeeking, 2021). A potential explanation for these inconsistent findings is that leverage may be associated with the disclosure of various types of APMs.

This study contributes to the understanding of the role of leverage in explaining variation in APM disclosures in two ways. First, this study is among the first to systematically explore how leverage may be simultaneously associated with different types of APM disclosures in annual reports. Empirical research on leverage as a determinant of APM disclosure typically examines the associations between leverage and disclosure of APMs. However, we argue that distinguishing between types of APM disclosures helps to better account for variation in APM disclosure practices and to clarify the mixed evidence reported in prior research. Specifically, in this explorative study, we distinguish between debt covenant-related APMs and efficiency-related APMs, in which the former relates to the disclosure of firms' ability to meet future payment obligations, and the latter relates to improving the prediction of future earnings. Inconsistencies regarding whether leverage has a positive, negative or no association may arise because, for example, a positive association with the disclosure of debt covenant-related APMs may be offset by a negative association with the disclosure of efficiency-related APMs. In addition, to better explain variation in APM disclosure practices, this study also distinguishes between the disclosure of APMs by profitable and loss-making

firms (Leung and Veenman, 2018). Compared with profitable firms, loss-making firms – especially those with high leverage – are associated with greater uncertainty about future cash flows, earnings and loan repayments, which may influence managers' APM disclosure choices. We further examine whether this distinction moderates the association between leverage and APM disclosures (Konstantinidi and Pope, 2016). Second, for a better understanding of how leverage shapes APM disclosure practices, it is also important to investigate whether managers disclose APMs to inform users and provide decision-useful information, or to mislead them. However, empirically disentangling their underlying motives is challenging, because managerial intentions are inherently unobservable. In this study, we provide new evidence on the incremental informativeness of APM disclosures by exploring conditions under which managers are more likely to use APMs opportunistically to mislead investors.

The remainder of this paper is structured as follows: first, we present the theoretical background that explains the relation between leverage and the disclosure of APMs, followed by the development of hypotheses. Next, we describe the research method and present the results. Finally, we summarize our conclusions and discuss the implications of the findings.

2. Theoretical background and hypothesis development

2.1 Theoretical framework

2.1.1 Theoretical background. Companies voluntarily choose to disclose APMs in annual reports. The literature typically uses economics-based theories of disclosure, such as signalling theory and agency theory, and socio-political theories, such as legitimacy theory, to explain the variation in these voluntary financial disclosures. Legitimacy theory explains that companies engage in voluntary disclosure of APMs to maintain or enhance their legitimacy for investors and other stakeholders. When leverage is high, such disclosures help reassure investors and creditors about financial health and reduce potential reputational risks. Signalling theory assumes that voluntary disclosure is a costly process and that managers of companies trade off the relative costs and benefits. In situations of asymmetric distribution of information, companies will voluntarily aim to convey information credibly to investors (i.e. the "signal") to differentiate themselves from other companies if the company's managers expect the perceived benefits to outweigh the marginal costs of disclosing the signal (Hahn and Reimsbach, 2021). For example, companies that are financially solid will try to differentiate themselves from lower-quality companies by publishing APMs – that is, sending a signal that the positive results will continue in the future. By signalling positive expectations about their future earnings and cash flows, they may try to gain competitive advantages, such as a reduction in the cost of equity and debt capital, or an increased stock price (Healy and Palepu, 2001).

However, agency theory suggests that APMs may also be disclosed for opportunistic reasons, potentially resulting in misleading or false signals (Doyle *et al.*, 2013). Managers may be strategically motivated to engage in misleading signalling when the expected benefits outweigh the incremental costs of producing the signal (Hahn and Reimsbach, 2021). In these situations, managers may selectively disclose predominantly favourable APMs to serve their own interests and enhance perceived legitimacy among stakeholders, rather than using APMs to present a more balanced view of a company's financial performance. The cost of disclosure also includes the cost of being detected, which depends on managers' risk preferences and the firm-specific context (Callery and Perkins, 2021).

Firms' managers are expected to choose the disclosure strategy to achieve the optimal difference between the expected incremental benefits and costs (Healy and Palepu, 2001).

However, their motivations to disclose APMs, and thus, the reasons for companies to distinguish themselves by disclosing APMs, can be diverse and depend on the firm-specific context (Young, 2014).

2.1.2 Associations of leverage with different types of alternative performance measures. In this study, we expect that leverage may be associated with the disclosure of different types of APMs. In the absence of a generally accepted model to classify the voluntary disclosure of financial performance measures in published reports (Ahmed and Courtis, 1999; Hassan and Marston, 2019; Healy and Palepu, 2001), we distinguish between two types of APM disclosures: debt covenant-related and efficiency-related APMs (Demerjian, 2011; Watson *et al.*, 2002). We define debt covenant-related APMs as non-GAAP performance measures that should help current and potential lenders and other creditors better assess the firms' ability to meet future payment obligations and are usually included in debt covenants (Dyreng *et al.*, 2017). For instance, they should help these capital providers to better assess financial risks, better predict future operating cash flows and earnings and better monitor performance in debt contracts. Examples of debt covenant-related APMs include leverage, current and liquidity ratios, interest coverage, fixed charge coverage and debt-to-earnings (Demerjian, 2011). Efficiency-related APMs, on the other hand, are intended to help investors better predict earnings and future operating cash flows, thereby supporting their resource allocation decisions. Accordingly, we define efficiency-related APMs as non-GAAP performance measures that enhance the prediction of future earnings and cash flows by evaluating a company's ability to generate returns and use its resources effectively. Examples of efficiency-related APMs include return on equity, return on assets, return on sales, capital turnover, sales per employee and stock turnover, with higher ratios indicating greater efficiency (Watson *et al.*, 2002). The distinction between debt covenant- and efficiency-related APMs could provide a more nuanced understanding of the relationship between leverage and APM disclosure practices (Jana and McMeeking, 2021). However, as argued before, APMs may be disclosed both to inform users and for opportunistic reasons, resulting in misleading signals, making managers' motives difficult – if not impossible – to disentangle (Doyle *et al.*, 2013).

2.2 Hypotheses

2.2.1 Associations of leverage with debt covenant-related alternative performance measure disclosures. Higher leverage leads, on average, to increased financial risks and a greater need for monitoring (Christensen *et al.*, 2016). Because capital providers rely on a company's financial reports to monitor its performance, firms with a relatively high proportion of assets financed through interest-bearing debt may disclose APMs to better meet the information needs of lenders and other investors. When companies have relatively high expectations about their future cash flows and financial performance, management may signal these expectations by disclosing additional debt covenant-related APMs. Such non-GAAP disclosures can help investors more accurately assess a firm's financial risks and monitor its ability to meet future payment obligations. Moreover, such APM disclosures may help reduce agency costs arising from information asymmetry between the firm and (potential) lenders and help firms gain competitive advantages, such as lower debt costs (Gietzmann and Trombetta, 2003).

However, when compliance with debt covenants becomes critical, or agency costs are high due to leverage, management may choose a selective and self-serving disclosure strategy ('cherry picking') using debt covenant-related APMs to proactively influence capital providers' perceptions by presenting an overly optimistic view of the firm's financial

position and risks. Thus, we expect that managers of highly leveraged firms, whether driven by informative or opportunistic motives, disclose more debt covenant-related APMs. Hence:

H1. Leverage is positively associated with the disclosure of debt covenant-related APMs.

2.2.2 Associations of leverage with efficiency-related alternative performance measures. On average, managers of highly leveraged companies focus more on disclosing debt covenant-related APMs than those of low-leverage firms. High levels of debt also increase the influence of debt capital providers through debt covenants, as contractually stipulated principal and interest payments reduce future free cash flows and constrain managerial choices. Consequently, high leverage may increase risk aversion, limit investments in profitable but risky projects, and reduce the persistence of positive results in the future. In addition, it may also increase liquidity and credit risks, further restricting managers' discretion.

However, if managers of highly leveraged firms anticipate that their company is unlikely to meet capital providers' earnings and future operating cash flow expectations, they have limited incentives to highlight this through efficiency-related APMs. Because such disclosures may negatively affect investors' perceptions, they may strategically disclose fewer efficiency-related APMs. Conversely, when a company is largely equity-funded, shareholders demand more information on how effectively and efficiently management uses assets. To meet this demand, managers may disclose more efficiency-related APMs to shape investors' perceptions. For these reasons, firms with high (low) leverage are expected to disclose fewer (more) efficiency-related APMs. Hence:

H2. Leverage is negatively associated with the disclosure of efficiency-related APMs.

2.2.3 The moderating role of firm financial performance. The firm-specific context is also important for a better understanding of the role of leverage in explaining variations in the disclosure of specific APMs. Consistent with Leung and Veenman (2018), who find that disclosures of non-GAAP earnings measures in press releases are particularly informative for loss-making firms and help investors better understand the nature and implications of GAAP losses, we examine whether a firm's financial performance moderates the association between leverage and disclosure of APMs. High leverage may result from losses in previous years, which reduce shareholders' equity and raise the debt-to-assets ratio. In addition, relative to profitable firms, loss-making firms face greater uncertainty about future profits and cash flows and a higher risk of not meeting debt covenants (e.g. Konstantinidi and Pope, 2016). For this reason, losses may be an important factor influencing APM disclosures (Ahmed and Courtis, 1999; Curtis *et al.*, 2014; Wittenberg-Moerman, 2008).

Uncertainty about a loss-making company's future performance and its ability to meet future debt covenants increases capital providers' demand for supplemental information (e.g. Healy and Palepu, 2001). Debt covenant-related APMs may provide such insight. However, if lenders and other capital providers perceive the company's credit and liquidity risks as higher or more critical than expected – which is more likely for loss-making companies – this incremental information may have a negative effect on the company's ability to meet obligations and hinder future financing. For this reason, we expect that highly leveraged, loss-making firms will generally be less likely to disclose debt covenant-related APMs compared to highly leveraged, profitable companies. Hence:

H3. The positive association between leverage and the disclosure of debt covenant-related APMs is stronger (weaker) for profitable firms (loss-making firms).

2.2.4 Conditions that increase the likelihood of debt covenant-related alternative performance measures disclosure for opportunistic reasons. In companies with poor financial health, i.e. highly leveraged, loss-making companies, managers are more likely to selectively disclose debt covenant-related APMs to obscure their unfavourable financial position. Opportunistic managers may strategically use such disclosures to inflate the capital providers' perceptions. Nevertheless, these firms are often later compelled to divest assets to meet future payment obligations and fulfil capital market expectations (Habib *et al*., 2020; Schweizer and Nienhaus, 2017). Managers' divestment decisions to restructure debts suggest that they opportunistically use APM disclosures to proactively redirect investors' attention away from the company's poor financial health. In this study, we expect that among highly leveraged firms, managers of loss-making firms are more likely than those of profitable firms to divest assets in subsequent years to comply with debt covenants, mitigate payment risk, and manage uncertainty regarding future profits and cash flows. They are also more likely to disclose debt covenant-related APMs opportunistically to proactively shape investors' perceptions of the firm's financial position and risks. Hence:

H4. Among the firms with high leverage, loss-making firms are more likely to disclose debt covenant-related APMs for opportunistic reasons than profitable firms.

3. Research method

3.1 Sample

To test our hypotheses, a panel data set of annual (integrated) reports was compiled covering an 8-year period (2012–2019) for publicly listed companies in the STOXX Europe 600 Index. The STOXX Europe 600 Index includes firms from across the European region and represents about 90% of the European market's total capitalization (STOXX, 2021). We start in 2012 because annual (integrated) reports for earlier financial years were, in most cases, no longer available on firms' websites at the time of data collection. We end in 2019, as ESMA indicated that from reports over the financial year 2020 onward, firms began disclosing or adjusting alternative performance measures in response to the effects of COVID-19 (ESMA, 2020). The financial information was extracted from Refinitiv Datastream (currently called LSEG). The disinvestment data were extracted from the M&A module (Dealscan) from LSEG. We excluded firms undergoing mergers and acquisitions or when certain information required for our analysis was missing. Our final sample includes data for 3,683 firm-year observations in 590 unique firms across 14 European countries in 2012–2019. Table 1 reports the distribution of these sample companies across countries and industries.

3.2 Variables

3.2.1 Dependent variables. We used industry-year-adjusted disclosure scores of debt covenants and efficiency-related APMs that were calculated in five steps. First, we manually identified all APMs disclosed in the annual reports of the sample firms. Second, we measured the annual disclosure of these APMs for each sample firm using computer-aided text analysis (CATA) software MAXQDA 2022 (Breijer and Orij, 2022). CATA reduces the subjectivity inherent in manual data collection, thereby improving the reliability and consistency of the measurement process. For each APM, we defined search terms and queries to systematically identify the presence and extent of predefined debt covenant-related and efficiency-related APMs in each firm's annual report. Third, in the absence of a generally accepted model to classify the voluntary disclosure of APMs (Ahmed and Courtis, 1999; Hassan and Marston, 2019; Healy and Palepu, 2001), this exploratory study relies on existing classifications to

Table 1. Descriptive statistics for sample firms

	Industry distribution1							
Country distribution	Manufacturing	Transportation Communication and Utilities	Trade	Services	Finance	Construction, Mining and Agriculture	No. of firm-year observations	%
Belgium	28	11	7	7	42	7	102	2.77
Denmark	91	21	0	25	21	0	158	4.29
Finland	55	14	14	7	17	0	107	2.91
France	181	46	42	112	108	21	510	13.85
Germany	211	73	21	73	77	7	462	12.54
Ireland	33	7	14	7	7	0	68	1.85
Italy	35	45	7	0	44	14	145	3.94
Netherlands	116	19	8	20	38	7	208	5.65
Norway	35	14	0	14	28	14	105	2.85
Poland	7	7	7	0	0	0	21	0.57
Spain	28	62	7	7	53	21	178	4.83
Sweden	189	14	21	29	90	14	357	9.69
Switzerland	167	28	5	23	96	0	319	8.66
United Kingdom	255	98	124	117	249	100	943	25.60
Total no. of firm-year observations	1,431	459	277	441	870	205	3,683	100.00
%	38.85	12.46	7.52	11.97	23.62	5.57		

Note(s): Our sample is composed of 3,683 firm-year observations in 590 unique firms in 45 industries based on the two-digit Standard Industrial Classification (SIC) codes, which we reclassified into six main industry groups for presentation purposes

categorize APMs. Specifically, we use the overview of performance measures included in debt covenants provided by Demerjian (2011) and the efficiency-related performance measures identified by Watson *et al.* (2002) to classify all APMs disclosed in the annual reports of the sample firms as either debt covenant-related or efficiency-related. This approach results in the identification of 20 debt covenant-related APM types and eight efficiency-related APM types.[1] Fourth, for each debt covenant-related and efficiency-related APM type, we assigned a value of 1 if at least one corresponding search term appeared in the annual report, and 0 otherwise. For each firm-year observation, we then calculated raw disclosure scores as the average of the 20 debt covenant-related indicators and the eight efficiency-related indicators, respectively (e.g. Hassan and Marston, 2019). Finally, since disclosure of both debt covenant-related and efficiency-related APMs can be highly industry-dependent and to avoid penalizing firms that could not disclose some of the APMs, we normalized the disclosure scores to a continuous [0, 1] scale across all firms in the same industry-year group. Higher scores indicate more APM disclosure relative to peer firms in the same industry-year group.

Because APM disclosure is a complex construct with a multidimensional nature, we also calculated additional composite measures to further assess the potential trade-off between debt covenant-related and efficiency-related APM disclosures. More specifically, we computed dummy variables that assess a firm's scores per year on debt covenant-related disclosures of APMs (DCD) in combination with its efficiency-related disclosures of APMs (ERD). The dummy variable $DCD_{High}\&ERD_{Low}$ is a dummy coded 1 (0 otherwise) if a firm's debt covenant-related disclosure of APMs in a given year is above the industry-year median and its efficiency-related disclosure of APMs is below the industry-year median, thus representing firms that have a relatively high level of debt covenant-related disclosure of APMs (DCD_{High}) combined with a low efficiency-related disclosure of APMs (ERD_{Low}). Similarly, $DCD_{Low}\&ERD_{High}$ is a dummy that represents firms with a low DCD and a high ERD in a given year (coded as 1 and 0 otherwise).

Divestments were measured as the total (Deal)value of divestments per firm per year. Firms are expected to engage in voluntary divestments to improve liquidity and reduce debt levels (Brauer, 2006).

3.2.2 Independent variables. Leverage (LEVERAGE) was measured as long-term debt divided by total assets (Dyreng *et al.*, 2017). For loss-making firms (LOSS), we used a dummy variable equalling 1 if the firm reported a loss during the financial year and 0 otherwise (Leung and Veenman, 2018). LOSS also indicates the condition that is expected to moderate the association between the disclosure of APMs and Leverage.

3.2.3 Control variables. In the panel data analyses, we included several control variables at the firm, industry and country levels. Consistent with prior research (Leung and Veenman, 2018), the control variables at the firm level include the natural logarithm of total assets (SIZE), the natural logarithm of the market-to-book ratio (MARKET-TO-BOOK), the annual change in sales divided by a firm's annual sales for the prior year (SALES GROWTH), a dummy variable equal to 1 if the firm was audited by a Big 4 auditor and 0 otherwise (BIG4), the percentage of a company's shares owned by institutions, i.e. owned by banks, insurance companies, investment companies, mutual fund companies, hedge funds, pensions, endowments and other asset managers (INSTITUTIONAL INVESTORS), and the natural logarithm of the total number of years since a firm's incorporation plus 1 (FIRM AGE).

At the industry level, we included industry fixed effects specified at the two-digit SIC level to control for sector-specific effects. Consistent with Isidro and Marques (2015), at the country-level we used the variables law and enforcement (Law and Enforcement) and investor protection (Investor Protection) to control for the influence of countries'

institutional settings on companies' choices regarding disclosures of APMs. LAW AND ENFORCEMENT is a composite proxy measured as the principal component of five dimensions of legal and enforcement systems efficiency: government effectiveness, regulatory quality, rule of law, control of corruption and public and private enforcement (Djankov *et al.*, 2008; Isidro and Marques, 2015). INVESTOR PROTECTION captures the level of protection of minority shareholders' rights, using the Djankov *et al.* (2008) score of investors' rights. Finally, in our panel data analyses, we included random effects at the firm and country levels to control for cross-firm and cross-country variation, and year fixed effects to control for time effects.

Table 2 summarises the variable definitions used in the analyses. Panel A of Table 3 reports sample statistics and Pearson's *r* correlations, which together with unreported variance inflation factors suggest no multicollinearity among firm-level variables. Panel B of Table 3 presents the normalized and raw disclosure scores of debt covenant-related and efficiency-related APMs across industries.

3.3 Research models

Our panel data has a multilevel structure with repeated firm-level measurements nested within countries. To account for this structure, which enables us to control for country-level factors that may impact managers' APM disclosure practices (Isidro and Marques, 2015), and the risk of heteroscedasticity, we used the following general multilevel mixed-effects linear model to test our hypotheses *H1*−*H3*:

Disclosure score of DEBT Covenant or efficiency-related:

$$\begin{aligned} \text{APMs}_{it} = {} & \beta_0 + \beta_1 \text{LEVERAGE}_{it-1} + \beta_2 \text{LOSS}_{it-1} + \beta_3 \text{LEVERAGE}_{it-1} \times \text{LOSS}_{it-1} \\ & + \beta_4 \text{FIRM}_{\text{CONTROL},\,it-1} + \beta_5 \text{INDUSTRY}_{\text{CONTROL},\,it} + \beta_6 \text{COUNTRY}_{\text{CONTROL},\,it} \\ & + \beta_7 \text{YEAR}_{\text{CONTROL},\,t} + \varepsilon_{it} \end{aligned} \tag{1}$$

where the dependent variables represent the measures of firms' debt covenant-related and efficiency-related disclosures of APMs_{it}. The independent variables $\text{LEVERAGE}_{it\text{-}1}$ and $\text{LOSS}_{it\text{-}1}$ explain variation in the corporate APM disclosure practices while controlling for the other factors specified in the model. To examine the associations between variables while mitigating simultaneity concerns, we used one-year lagged effects for LEVERAGE and LOSS.

To address the fact that the association between disclosure of debt covenant-related and efficiency-related APMs_{it} and $\text{LEVERAGE}_{it\text{-}1}$ may differ depending on the firm's financial performance, we also analysed the interaction effects between the lagged effects of LEVERAGE and LOSS. We estimated models, including the one-year lagged effect of LEVERAGE and LOSS, along with their interactions. $\text{LEVERAGE}_{it\text{-}1}$ was mean-centered to avoid potential multicollinearity issues.

To further examine the potential trade-off between disclosures of debt covenant-related and efficiency-related APMs_{it}, we also analysed whether leveraged firms (i) are more likely to use combinations of high levels of disclosures of debt covenant-related APMs and low levels of disclosures of efficiency-related APMs and (ii) are less likely to use combinations of low levels of disclosures of debt covenant-related APMs and high levels of disclosures of efficiency-related APMs. To test this, we specified another econometric model, which estimates the likelihood of a firm using one of these two opposing combinations, with $\text{DCD}_{\text{High}}\&\text{ERD}_{\text{Low}}$ or $\text{DCD}_{\text{Low}}\&\text{ERD}_{\text{High}}$ as the dependent variable:

Table 2. Variable definitions

Variable name	Definition
Normalized disclosure score of debt-covenant-related APMS	Normalized disclosure score of a firm's debt covenant-related APMs on a continuous [0, 1] scale across all firms in the same industry-year group. Higher disclosure scores indicate greater disclosure of debt covenant-related APMs relative to peer firms in the same industry-year group
Normalized disclosure score of efficiency-related APMS	Normalized disclosure score of a firm's efficiency-related APMs on a continuous [0, 1] scale across all firms in the same industry-year group. Higher disclosure score indicate greater disclosure of efficiency-related APMs relative to peer firms in the same industry-year group
Raw disclosure score of Debt-Covenant-Related APMS	Raw disclosure score of a firm's debt covenant-related APMs calculated as the average of twenty debt covenant-related APMs indicators
Raw disclosure score of efficiency-related APMS	Raw disclosure score of a firm's efficiency-related APMs calculated as the average of eight efficiency-related APMs indicators
$DCD_{High}\&ERD_{Low}$	A dummy coded 1 (0 otherwise) if a firm's debt covenant-related APM disclosure score (DCD) in a given year is above the industry-year median and its efficiency-related APM disclosure score (ERD) is below the industry-year median
$DCD_{Low}\&ERD_{High}$	A dummy coded 1 (0 otherwise) if a firm's debt covenant-related APM disclosure score in a given year is below the industry-year median and its efficiency-related disclosure of APMs is above the industry-year median
Divestments	A firm's total (Deal)value of disinvestments per year
Leverage	Long term debt divided by total assets
Loss	Dummy variable that is equal to one if the firm reported a loss during the year, and zero otherwise
Size	Natural logarithm of the firm's year-end total assets
Market-to-book	Natural logarithm of the market to book ratio
Sales growth	The annual change in sales divided by a firm's prior year's annual sales
BIG4	Dummy variable that is equal to one if the firm is audited by a Big 4 auditor, and 0 otherwise
Institutional investors	Percentage of a company's shares owned by institutions (Lewellen and Lewellen, 2022)
Firm age	Natural logarithm of the total number of years since a firm's incorporation plus one
Law and Enforcement	Composite proxy measured as the principal component of scores on five legal and enforcement efficiency dimensions: government effectiveness, regulatory quality, rule of law, control of corruption, and public and private enforcement (Djankov *et al.*, 2008; Isidro and Marques, 2015)
Investor protection	Measure of the level of protection of minority shareholders' rights (Djankov *et al.*, 2008)

$$\begin{aligned} DCD_{High}\&ERD_{Low,it} \text{ or } DCD_{Low}\&ERD_{High,it} = {} & \beta_0 + \beta_1 LEVERAGE_{it-1} + \beta_2 LOSS_{it-1} \\ & + \beta_3 LEVERAGE_{it-1} \times LOSS_{it-1} + \beta_4 FIRM_{CONTROL,it-1} \\ & + \beta_5 INDUSTRY_{CONTROL,it} + \beta_6 COUNTRY_{CONTROL,it} \\ & + \beta_7 YEAR_{CONTROL,t} + \varepsilon_{it} \end{aligned} \quad (2)$$

As estimation method for equation (2), we used multilevel logistic regressions. The independent and control variables in equation (2) are identical to equation (1).

To test *H4*, we used a lead-lag design to examine the association between the disclosure of APMs in year t and divestments in year t_{+1}, using the following multilevel mixed-effects linear model:

Table 3. Descriptive statistics for sample firms

Variable	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11	12	13
Panel A. Descriptive statistics and Pearson's r correlations																	
1. Disclosure score of DEBT-Covenant-Related APMS	0.413	0.238	0	1	1.000												
2. DIsclosure score of efficiency-related APMS	0.462	0.232	0	1	*0.143*	1.000											
3. DCD_{High}&ERD_{Low}	0.271	0.444	0	1	*0.361*	*-0.483*	1.000										
4. DCD_{Low}&ERD_{High}	0.193	0.395	0	1	*-0.389*	*0.344*	*-0.299*	1.000									
5. Leverage	0.192	0.148	0	0.995	*0.159*	*-0.047*	*0.135*	*-0.093*	1.000								
6. Loss	0.057	0.231	0	1	0.027	*-0.060*	0.013	-0.008	*0.028*	1.000							
7. Size	10.055	0.817	5.837	12.384	*0.097*	*0.254*	*-0.105*	*0.052*	*-0.015*	*0.020*	1.000						
8. Market-to-book	0.368	0.295	0	1	*0.124*	0.011	0.002	*-0.037*	*-0.089*	*0.073*	*0.190*	1.000					
9. Sales growth	0.091	0.494	-4.078	17.847	0.014	0.039	0.008	-0.012	-0.011	0.014	*-0.081*	0.001	1.000				
10. BIG4	0.901	0.299	0	1	*0.092*	*0.111*	*-0.040*	0.008	0.009	0.035	*0.038*	0.010	*-0.068*	1.000			
11. Institutional investors	0.242	0.063	0	0.357	-0.011	0.004	-0.018	-0.011	0.001	0.015	-0.004	-0.009	0.001	-0.003	1.000		
12. Firm age	0.821	0.172	0	1.117	*0.067*	*0.069*	-0.023	-0.017	*-0.120*	*-0.074*	0.113	*0.074*	*-0.076*	*0.115*	-0.000	1.000	
12. Law and enforcement	3.576	1.137	-0.1	5	*0.097*	-0.002	*0.094*	-0.007	0.017	0.013	*-0.077*	*-0.077*	-0.007	*-0.053*	0.107	*0.107*	1.000
13. Investor protection	3.634	0.993	2	5	*0.104*	-0.011	*0.095*	-0.004	0.015	*0.021*	*-0.099*	*-0.069*	0.003	-0.047	0.117	*0.956*	*0.957*

Panel B. Normalized and raw disclosure scores of debt covenant-related and efficiency-related APMs across industries

Industry	No. of firm-year observations	Disclosure scores of Debt-covenant-related APMS		Disclosure scores of efficiency-related APMS	
		Normalized Mean (SD)	Raw Mean (SD)	Normalized Mean (SD)	Raw Mean (SD)
Manufacturing	1,431	0.376 (0.227)	0.107 (0.064)	0.429 (0.179)	0.255 (0.107)
Transportation, communication & utilities	459	0.444 (0.242)	0.117 (0.062)	0.468 (0.210)	0.227 (0.108)
Trade	277	0.454 (0.246)	0.124 (0.067)	0.430 (0.220)	0.245 (0.093)
Services	441	0.484 (0.231)	0.121 (0.058)	0.368 (0.207)	0.191 (0.110)
Finance	870	0.388 (0.215)	0.115 (0.062)	0.555 (0.271)	0.230 (0.110)
Construction, mining & agriculture	205	0.491 (0.320)	0.104 (0.070)	0.525 (0.329)	0.246 (0.098)
Total	3,683	0.412 (0.238)	0.113 (0.063)	0.462 (0.236)	0.237 (0.109)

Note(s): Panel A provides the definitions of the variables. Correlations that are significant at a level below 5 % (Two-tailed) are in italic. All variables are defined in Panel B. The classification of industry groups is explained in Table 1

$$\text{DIVESTMENTS}_{it+1} = \beta_0 + \beta_1 \text{DISCLOSURE SCORE OF DEBT COVENANT or EFFICIENCY–RELATED APMs}_{it} + \beta_2 \text{LOSS}_{it} + \beta_3 \text{FIRM}_{\text{CONTROL},it} + \beta_4 \text{INDUSTRY}_{\text{CONTROL},it} + \beta_5 \text{COUNTRY}_{\text{CONTROL},it} + \beta_6 \text{YEAR}_{\text{CONTROL},t} + \varepsilon_{it} \quad (3)$$

where the dependent variables represent the measure of firm's divestments$_{it+1}$. The independent variables Disclosure score of DEBT Covenant APMs$_{it}$ or efficiency-related APMs$_{it}$ and LOSS$_{it}$ explain variation in corporate divestment practices while controlling for the other factors specified in the model. The Pearson correlations reported in Table 3, along with variance inflation factors (not reported), indicate that multicollinearity is not a concern.

4. Results

4.1 Regression results

Table 4 depicts the results to test the hypotheses related to the associations between the lagged effects of leverage and the disclosure of debt covenant-related and efficiency-related APMs. In Models 1 and 2 and 4 and 5, the dependent variables are the normalized disclosure scores of debt covenant-related APMs and efficiency-related APMs, respectively, whereas Models 3 and 6 use the raw disclosure scores.

Models 1–3 in Table 4 shows significantly positive relationships between one-year lagged effects of leverage and normalized and raw disclosure scores of debt covenant-related APMs, after controlling for variations in companies' non-GAAP disclosures related to the other factors specified in the model. These results support *H1*, indicating that leverage is positively associated with a firm's disclosure of debt covenant-related APMs. Specifically, the findings suggest that firms with higher leverage expect to benefit more from disclosing debt covenant-related APMs than firms with lower leverage.

Model 4–6 in Table 4 show that the lagged effects of leverage are significantly negatively related to disclosure scores of efficiency-related APMs. These results support *H2*, which predicts that leverage is negatively associated with the disclosure of efficiency-related APMs. The results indicate that, on average, companies with high leverage are less inclined to disclose information on the efficiency of their company performance.

To further examine the potential trade-off between debt covenant-related and efficiency-related APM disclosures, Table 5 reports the results of the multilevel logistic regressions using the combinations of high and low normalized disclosure scores as dependent variables. Models 1 and 2 of Table 5 show significant positive associations between lagged leverage and the likelihood of disclosing high levels of debt covenant-related APMs in combination with low levels of efficiency-related APMs. In addition, Models 3 and 4 show significant negative coefficients for leverage, indicating that highly leveraged firms are less likely to disclose combinations of low levels of debt covenant-related APMs and high levels of efficiency-related APMs. Together, these results provide additional support for *H1* and *H2*, suggesting that leverage is positively associated with the disclosure of debt covenant-related APMs but negatively related to efficiency-related APM disclosures.

Models 2 and 3 of Table 4 also report the results to test *H3*, which predicts that loss-making highly leveraged firms disclose fewer debt covenant-related APMs compared with profitable firms with high leverage. The lagged interaction between leverage and loss is significantly negative, indicating that the positive association between leverage and a firm's disclosure of debt covenant-related APMs is weaker for loss-making firms than it is for profitable firms. Model 2 of Table 5 provides additional evidence of this conditional

Table 4. Multilevel mixed-effects linear regression results for firms' normalized and raw disclosure scores of debt covenant-related and efficiency-related APMs

	DISCLOSURE SCORES OF DEBT-COVENANT-RELATED APMs$_{it}$			DISCLOSURE SCORES OF EFFICIENCY-RELATED APMs$_{it}$		
	Normalized		Raw	Normalized		Raw
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
H1/*H2*: LEVERAGE$_{it-1}$	0.246*** (0.026)	0.259*** (0.027)	0.071*** (0.007)	−0.065*** (0.025)	−0.063** (0.025)	−0.021** (0.012)
LOSS$_{it-1}$	−0.000 (0.015)	0.001 (0.015)	0.001 (0.004)	−0.054*** (0.014)	−0.054*** (0.014)	−0.028*** (0.007)
H3: LEVERAGE$_{it-1}$ x LOSS$_{it-1}$		−0.157** (0.086)	−0.034* (0.023)		−0.029 (0.080)	−0.010 (0.038)
SIZE$_{it-1}$	0.039*** (0.005)	0.040*** (0.005)	0.011*** (0.001)	0.067*** (0.005)	0.067*** (0.005)	0.029*** (0.002)
MARKET-TO-BOOK$_{it-1}$	0.081*** (0.013)	0.080*** (0.013)	0.022*** (0.003)	0.008 (0.012)	0.008 (0.012)	−0.004 (0.006)
SALES GROWTH$_{it-1}$	0.011* (0.006)	0.011* (0.006)	0.003* (0.002)	0.010* (0.006)	0.010* (0.006)	0.002 (0.003)
BIG4$_{it-1}$	0.051*** (0.014)	0.050*** (0.014)	0.012*** (0.004)	0.058*** (0.013)	0.058*** (0.013)	0.031*** (0.006)
INSTITUTIONAL INVESTORS$_{it-1}$	−0.117 (0.575)	−0.116 (0.575)	−0.036 (0.154)	0.432 (0.540)	0.433 (0.540)	0.222 (0.256)
FIRM AGE$_{it-1}$	0.071*** (0.023)	0.070*** (0.023)	0.015** (0.006)	0.033 (0.022)	0.032 (0.022)	0.025** (0.010)
LAW AND ENFORCEMENT$_{it}$	0.008 (0.030)	0.009 (0.030)	0.004 (0.009)	0.027 (0.036)	0.027 (0.036)	0.013 (0.018)
INVESTOR PROTECTION$_{it}$	0.011 (0.041)	0.010 (0.041)	0.001 (0.012)	−0.027 (0.050)	−0.027 (0.050)	−0.012 (0.025)
Industry fixed effects[a]	Included	Included	Included	Included	Included	Included
Year fixed effects[a]	Included	Included	(0.024)	Included	Included	Included
Random country effects[a]	Included	Included	Included	Included	Included	Included
Random firm effects[a]	Included	Included	Included	Included	Included	Included
Constant	−0.257*** (0.086)	−0.261*** (0.085)	−0.068*** (0.024)	−0.282*** (0.094)	−0.283*** (0.095)	−0.065 (0.047)
Number of observations	3,683	3,683	3,683	3,683	3,683	3,683
Wald–Chi^2	362.81***	366.54***	288.20***	617.15***	617.31***	353.44***

Note(s): Table 2 provides the definitions of the variables. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ (Standard errors in parentheses). [a]Individual coefficients of the industry and year fixed effects and random country and firm effects are not reported for parsimony

Table 5. Multilevel logistic regression results for firms' combinations of high and low levels of debt covenant-related APM disclosures (DCD) and efficiency-related APM disclosures (ERD)

	$DCD_{High}\&ERD_{Low\ it}$		$DCD_{Low}\&ERD_{High\ it}$	
Variables	Model 1	Model 2	Model 3	Model 4
H1/*H2*: $LEVERAGE_{it-1}$	2.432*** (0.283)	2.590*** (0.297)	−1.666*** (0.340)	−1.818*** (0.354)
$LOSS_{it-1}$	−0.014 (0.170)	0.332 (0.255)	0.168 (0.199)	−0.182 (0.301)
H3: $LEVERAGE_{it-1}$ x $LOSS_{it-1}$		−1.588** (0.904)		1.741* (1.062)
$SIZE_{it-1}$	−0.201*** (0.062)	−0.200*** (0.062)	0.029 (0.065)	0.026 (0.065)
$MARKET\text{-}TO\text{-}BOOK_{it-1}$	0.028 (0.141)	0.024 (0.141)	−0.138 (0.164)	−0.121 (0.164)
$SALES\ GROWTH_{it-1}$	0.030 (0.079)	0.032 (0.079)	−0.149 (0.115)	−0.155 (0.118)
$BIG4_{it-1}$	−0.182 (0.149)	−0.186 (0.149)	−0.090 (0.182)	−0.086 (0.182)
$INSTITUTIONAL\ INVESTORS_{it-1}$	−0.395 (0.909)	−0.383 (0.901)	0.154 (0.768)	0.158 (0.770)
$FIRM\ AGE_{it-1}$	0.022 (0.254)	0.014 (0.254)	−0.480* (0.269)	−0.474* (0.269)
$LAW\ AND\ ENFORCEMENT_{it}$	0.019 (0.313)	0.028 (0.313)	0.050 (0.303)	0.050 (0.303)
$INVESTOR\ PROTECTION_{it}$	0.173 (0.427)	0.168 (0.425)	−0.041 (0.417)	−0.043 (0.417)
Industry fixed effects	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included
Random country effects	Included	Included	Included	Included
Random firm effects	Included	Included	Included	Included
Constant	0.037 (0.970)	0.026 (0.968)	−1.534 (1.042)	−1.545 (1.042)
Number of observations	3,683	3,683	3,683	3,683
$Wald\_Chi^2$	240.97***	243.24***	224.74***	226.98***

Note(s): Table 2 provides the definitions of the variables. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ (Standard errors in parentheses)

relationship. The significantly negative lagged interaction effect indicates that, compared to profitable firms with high leverage, loss-making firms with high leverage are less likely to disclose combinations of high levels of debt covenant-related APMs and low levels of efficiency-related APMs. Collectively, these results provide strong support for *H1–H3*.

Table 6 presents the results to test *H4*, which predicts that, among the highly leveraged firms, loss-making firms are more likely than profitable firms to disclose debt covenant-related APMs for opportunistic reasons. The results in Model 2 for the subsample of highly leveraged firms show that the lagged interaction between debt covenant-related APM disclosure and loss is significantly positively associated with divestments in the following year. In contrast, the results in Model 3 for the subsample of low-leveraged firms show no significant association. Consistent with *H4*, these results suggest that, on average, managers of companies in poor financial health, i.e. highly leveraged, loss-making companies, are more likely than those of highly leveraged, profitable firms to disclose APMs opportunistically to proactively influence investors' perceptions and obscure the company's true financial position and associated risks.

4.2 Robustness analysis

First, because APM disclosure is a complex construct that is challenging to measure, we repeated the analysis using the raw disclosure scores as a robustness check. Models 3 and 6 in Table 4 show that the results using raw scores are qualitatively consistent with the normalized scores in Models 2 and 5, confirming the robustness of our findings to alternative measures of APM disclosure. We also reran the regressions using unlagged and two-year lagged leverage (instead of a one-year lag) to account for potentially short- and longer-term effects. These untabulated results are consistent with the main findings. In addition, the results remain robust whether the UK (943 observations; 26% of the sample) is included or excluded, as well as across finance and non-finance industries (untabulated). Moreover, OLS regressions incorporating country, industry and year fixed effects produce qualitatively similar results (untabulated). To address potential endogeneity – where firm-specific characteristics influence both APM disclosure and leverage – we employed two-stage least squares (2SLS) using industry-year mean leverage as an instrument. The untabulated results indicate no evidence of endogeneity bias. Overall, none of the robustness tests alter our findings, confirming their qualitative robustness.

5. Conclusion, implications and discussion

5.1 Conclusion

This study contributes to the literature by advancing our understanding of how leverage explains variation in APM disclosures in two ways. First, we examine how leverage relates simultaneously to different types of APM disclosures in annual reports. By distinguishing between debt covenant-related and efficiency-related APMs, and by differentiating between profitable and loss-making firms, we extend prior research. Our results show that debt covenant-related APM disclosures are positively associated with leverage, whereas efficiency-related APM disclosures are negatively associated with leverage. This finding suggests that leverage is simultaneously associated with different types of APM disclosures in opposite directions, which may help explain the mixed evidence in prior studies. Moreover, the positive association between leverage and debt covenant-related APM disclosures is more pronounced for profitable firms than for loss-making firms, suggesting that highly leveraged firms use APM disclosures strategically to differentiate themselves. Second, while APMs may be disclosed to inform users and provide decision-useful information, they may also be disclosed opportunistically to mislead investors. Although empirically disentangling managers' underlying motives is inherently challenging due to the

Table 6. Multilevel mixed-effects linear regression results with divestment t+1 as dependent variable and debt covenant-related and efficiency-related APM disclosures and loss as independent variables (subsample analysis)

	DIVESTMENTS$_{it+1}$[a]					
		Subsamples			Subsamples	
Variables	Total sample Model 1	High leverage Model 2	Low leverage Model 3	Total sample Model 4	High leverage Model 5	Low leverage Model 6
DISCLOSURE SCORE OF DEBT-COVENANT-RELATED (DC) APMs$_{it-1}$	0.275*** (0.094)	0.383*** (0.141)	0.253* (0.132)			
LOSS$_{it-1}$	0.061 (0.092)	0.170 (0.138)	−0.046 (0.127)	0.087 (0.093)	0.219 (0.134)	−0.059 (0.134)
DISCLOSURE SCORE OF DC APMsi$_{it-1}$ × LOSS$_{it-1}$	0.685* (0.386)	1.015** (0.529)	−0.122 (0.576)			
DISCLOSURE SCORE OF EFFICIENCY-RELATED (ER) APMs$_{it-1}$				−0.256*** (0.099)	−0.528*** (0.147)	−0.019 (0.137)
DISCLOSURE SCORE OF ER APMsi$_{i-1t}$ × LOSS$_{it-1}$				0.350 (0.365)	0.694 (0.550)	−0.157 (0.501)
SIZE$_{it}$	0.287*** (0.030)	0.404*** (0.050)	0.242*** (0.040)	0.309*** (0.030)	0.444*** (0.051)	0.256*** (0.040)
MARKET-TO-BOOK$_{it}$	0.037 (0.073)	0.045 (0.109)	0.038 (0.101)	0.060 (0.073)	0.106 (0.108)	0.060 (0.101)
SALES GROWTH$_{it}$	0.007 (0.032)	0.018 (0.047)	0.008 (0.045)	0.014 (0.032)	0.040 (0.047)	0.007 (0.045)
BIG4$_{it}$	−0.070 (0.070)	−0.040 (0.109)	−0.134 (0.097)	−0.033 (0.071)	0.037 (0.110)	−0.121 (0.096)
INSTITUTIONAL INVESTORS$_{it}$	−0.104 (0.303)	−0.666 (1.197)	−0.053 (0.311)	−0.103 (0.304)	−0.621 (1.198)	−0.056 (0.311)
FIRM AGE$_{it}$	−0.183 (0.133)	−0.260 (0.187)	−0.149 (0.197)	−0.156 (0.134)	−0.179 (0.188)	−0.135 (0.197)
LAW AND ENFORCEMENT$_{it}$	−0.104 (0.064)	−0.234** (0.104)	−0.010 (0.086)	−0.094 (0.064)	−0.223** (0.108)	−0.005 (0.086)
INVESTOR PROTECTION$_{it}$	0.105 (0.074)	0.218* (0.124)	0.028 (0.103)	0.100 (0.074)	0.220* (0.130)	0.028 (0.102)
Industry fixed effects	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Random country effects	Included	Included	Included	Included	Included	Included
Random firm effects	Included	Included	Included	Included	Included	Included
Constant	−2.463*** (0.316)	−3.635*** (0.540)	−2.000*** (0.430)	−2.549*** (0.317)	−3.837*** (0.546)	−2.088*** (0.426)
No. of observations	3.130	1.520	1.610	3.130	1.520	1.610
Wald_Chi^2	157.98***	118.93***	66.57***	149.45***	116.71***	63.18***

Note(s): Table 2 provides the definitions of the variables. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ (Standard errors in parentheses). [a]All coefficients have been multiplied by 1000

unobservable nature of managerial intentions, this study examines conditions under which managers are more likely to use APM disclosures opportunistically. Specifically, we investigate whether, among highly leveraged firms, loss-making firms are more likely than profitable firms to disclose debt covenant-related APMs for opportunistic reasons by examining the association between APM disclosures in year t and divestments in year t_{+1}. Our findings suggest that, among highly leveraged firms, managers of loss-making firms are more likely than those of profitable firms to strategically disclose APMs to influence investors' perceptions when future obligations or capital market expectations are at risk.

5.2 Implications

The results have several implications for policymakers, investors and future research. First, for standard setters, our findings indicate that distinguishing between different types of APMs and incorporating moderating factors improves the explanation of variation in APM disclosure practices. Standard setters may consider refining existing reporting standards and governance frameworks and expanding guidance on types of voluntary disclosures – including APMs – to enhance financial reporting quality and improve comparability across firms (Young, 2014). Second, the results highlight the importance for investors to distinguish between different types of APMs. The findings suggest that managers may strategically use specific APMs to provide useful information to investors, while other APMs may be disclosed opportunistically to shape investors' perceptions of financial risk and performance. Finally, the findings have implications for research. They indicate that determinants of APM disclosure may have heterogeneous effects across different types of APMs and highlight the importance of including moderating variables to account for firm-specific contexts. To advance understanding of the determinants and consequences of APM disclosure, we encourage future research to differentiate among simultaneously disclosed types of APMs to better explain variation in APM disclosure practices.

5.3 Discussion

We acknowledge that our results should be interpreted in light of several limitations. Two limitations relate to the measurement of APMs and data availability. Regarding the former, because APMs are not explicitly defined in accounting standards, managers can exercise considerable discretion in their definition and calculation (Black *et al.*, 2018, 2021). As a result, firms are unlikely to use uniform measurement methods. Moreover, APM disclosures are voluntary and may be selective, self-serving or even aggressive (Black *et al.*, 2018; Guillamon-Saorin *et al.*, 2017). These disclosures are often not externally verified, raising concerns about the reliability and comparability of APM disclosures across firms and over time (Young, 2014). In addition, our disclosure scores are based on a comprehensive set of binary indicators capturing the presence of APM disclosures in annual reports. Our scores provide a detailed overview of reporting practices but do not capture the degree of managerial discretion or underlying motives. In addition, due to the lack of suitable alternatives, we use the association between lagged APM disclosures and future divestments as a proxy for opportunistic disclosure behaviour. This proxy is inherently indirect, which limits its ability to fully distinguish informative from opportunistic APM disclosures. Finally, our study may be subject to potential endogeneity concerns due to unobservable factors that may both influence leverage and APM disclosure. Although we mitigate these concerns by using lagged independent variables, panel regressions with firm fixed effects and by focusing on associations rather than causation, future research could further explore additional factors influencing the association between leverage and APM disclosure decisions.

To provide new evidence to better explain variation in APM disclosures and their incremental informativeness, this study adopts an archival approach in firm-specific settings.

Future research could benefit from triangulating these findings with event studies, value relevance analyses or experimental designs to further assess the incremental informativeness of APMs (e.g. Brosnan *et al.*, 2023). Moreover, APM disclosures, including debt covenant-related APMs, may be influenced by legislation and regulatory requirements (Herr *et al.*, 2022; Marques, 2017). For example, in cases of covenant violations, IFRS 7 requires firms to provide enhanced qualitative and quantitative disclosures on credit and liquidity risk and related risk management practices, facilitating investor monitoring and assessment of firms' ability to meet financial obligations (Christensen *et al.*, 2019). For these reasons, future research could also use alternative measures of APM disclosures to strengthen the robustness of empirical findings.

Due to data constraints, our analyses are based on annual reports of large, publicly listed European firms. Consequently, APM disclosure practices in other institutional contexts, such as the USA, Australia, Asia and Africa and private companies, were not considered, nor were other disclosure channels, such as press releases. Future research could use larger international panel data sets that include both public and private firms and multiple disclosure outlets to further advance understanding of the conditions that facilitate or inhibit APM disclosure across different (inter)national settings. Finally, by distinguishing between debt covenant-related and efficiency-related APM disclosures and between profitable and loss-making firms, this study offers a more nuanced understanding of how leverage is associated with variation in APM disclosure. Future research could examine additional determinants and interactions, refine APM disclosure classifications or explore alternative classification schemes. A deeper understanding of the determinants and consequences of APM disclosure is important as it can enhance investor awareness and support more informed economic decision-making – particularly with respect to firms' ability to meet future payment obligations – and assist standard setters in mitigating the risks associated with APM disclosure practices.

Note

[1.] A comprehensive overview of all identified APMs, classified into the twenty debt covenant–related and eight efficiency-related (sub)groups and including the corresponding search queries, is available from the corresponding author.

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